

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

April 19, 2010

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

Resubmittal of Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Dr. Brian Bowen, University of Hawaii, Hawaii Institute of Marine Biology, for Access to State Waters to Conduct Reef Fish Genetic Survey Activities

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to Dr. Brian Bowen, associate researcher, University of Hawaii, Hawaii Institute of Marine Biology, pursuant to § 187A-6, Hawaii Revised Statutes (HRS), chapter 13-60.5, Hawaii Administrative Rules (HAR), and all other applicable laws and regulations.

The research permit, as described below, would allow entry and research activities to occur in Papahānaumokuākea Marine National Monument (Monument), including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following sites:

- Nihoa Island
- Necker Island (Mokumanamana)
- French Frigate Shoals
- Gardner Pinnacles
- Maro Reef
- Laysan Island
- Lisianski Island, Neva Shoal
- Pearl and Hermes Atoll
- Kure Atoll State Seabird Sanctuary

The activities covered under this permit would occur between May 1, 2010 and October 31, 2010.

The Department has made an exemption determination for this permit in accordance chapter 343, HRS, and Chapter 11-200, HAR. See Attachment ("DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. BRIAN BOWEN, UNIVERSITY OF HAWAII, HAWAII INSTITUTE OF MARINE BIOLOGY, FOR ACCESS TO STATE WATERS TO CONDUCT REEF FISH GENETIC SURVEY ACTIVITIES UNDER PERMIT PMNM-2010-038").

The proposed activities are largely a renewal of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES:

The purpose of these activities is to conduct a genetic survey of reef fishes, which would address the level of isolation between reef ecosystems across the Hawaiian Archipelago. In addition, DNA technology would be used to examine an invasive parasite that was introduced to Oahu in the 1950s, but has been detected in Papahānaumokuākea.

To carry out this survey, the applicant is requesting to collect target reef fish species. The target species (see collection list at the end of application, item F-4a) are chosen to be abundant and widespread in the archipelago, easy to identify, and easy to collect. No more than 10 specimens/species would be taken at any single island or atoll. Whenever possible, the applicant samples non-lethally and removes a rice-grain sized piece of fin and releases the animal in the location from which it was collected. Although significant progress has been made in nonlethal sampling, most specimens are collected with polespears.

The activities described above are part of a multiyear project. As such, collection was completed on five additional species during 2009, and those species have been removed from the 2010 collection list. The Applicant predicts that for most of the remaining species, 2010 will be the last year for collections.

A new aspect of the project involves the collection of a seven species from the deep reefs (>130 ft) for similar genetic connectivity purposes, as well as voucher specimens of any new species encountered. These samples would be collected during a technical dive cruise proposed to take place in July/August.

The applicant recognizes that it is important to make maximum use of specimens, especially when they are derived from lethal collections. Towards this end, he has coordinated fish species lists with parallel projects by HIMB researchers Eric Franklin (who would use the specimens to resolve age, growth, diet, and other aspects of natural history) and Greta Aeby (who would examine the specimens for a parasitic nematode that has been detected in the Monument). Further, the applicant is requesting the nonlethal sampling of apex predators to make maximum use of the captures conducted by Carl Meyer and colleagues for tagging studies.

This research would help determine whether the Monument is a series of relatively fragile (isolated) ecosystems, or whether individual reef habitats are connected in a larger and more robust ecosystem. It will also address the issue about whether the NWHI serves as a source of larvae to replenish depleted fisheries in the main Hawaiian Islands.

The activities proposed by the applicant directly support the Monument Management Plan's priority management needs 3.1 – Understanding and Interpreting the NWHI (through action plan 3.1.1 – Marine Conservation Science).

The activities described above may require the following regulated activities to occur in State waters:

- ☒ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving monument resource
- ☒ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- ☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since March 15th, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Comments received from the scientific community are summarized as follows:

Scientific reviews support the acceptance of this application.

Concerns raised:

1. Clarification on the fish trap methodology, as the application mentions the use of fish traps.

Comments received from the Native Hawaiian community are summarized as follows:

Cultural reviews support the acceptance of this application. No concerns were raised.

Comments received from the public are summarized as follows:

No comments were received from the public on this application.

Additional reviews and permit history:

Are there other relevant/necessary permits or environmental reviews that have or will be issued with regard to this project? (e.g. MMPA, ESA, EA) Yes ☒ No ☐

If so, please list or explain:

- The proposed activities are in compliance with the National Environmental Policy Act.
- The proposed activities are in compliance with HRS Chapter 343 (exemption class HAR §11-200-8(a)(5)).

Has Applicant been granted a permit from the State in the past? Yes ☒ No ☐

If so, please summarize past permits:

- The applicant was granted permits DLNR/NWHI/06R004, PMNM-2007-032, PMNM-2008-046, and PMNM-2009-044 to conduct similar work in 2006 through 2009.

Have there been any a) violations: Yes ☐ No ☒
b) Late/incomplete post-activity reports: Yes ☐ No ☒

Are there any other relevant concerns from previous permits? Yes ☐ No ☒

RESPONSE:

1. The Applicant states that since the permit application was submitted, new developments (change in team personnel and trap location) have rendered the use of traps untenable this year. The request to use fish trap in 2010 has been withdrawn.

STAFF OPINION:

DAR staff is of the opinion that Applicant has properly demonstrated valid justifications for his application and should be allowed to enter the NWHI State waters and to conduct the activities therein as specified in the application with certain special instructions and conditions, which are in addition to the Papahānaumokuākea Marine National Monument Research Permit General Conditions. All suggested special conditions have been vetted through the legal counsel of the Co-Trustee agencies (see Recommendation section).

MONUMENT MANAGEMENT BOARD OPINION:

The MMB is of the opinion that the Applicant has met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by DAR staff.

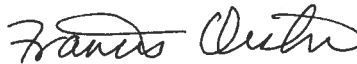
RECOMMENDATION:

That the Board authorize and approve a Research Permit to Dr. Brian Bowen, University of Hawaii, Hawaii Institute of Marine Biology, with the following special conditions:

1. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized activities must be for noncommercial purposes not involving the use or sale of any organism, by-products, or materials collected within the Monument for obtaining patent or intellectual property rights.
2. The permittee may not convey, transfer, or distribute, in any fashion (including, but not limited to, selling, trading, giving, or loaning) any coral, live rock, or organism collected under this permit without the express written permission of the Co-Trustees.

3. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocols attached to this permit.
4. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.
5. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State Marine Refuge
6. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

Respectfully submitted,



 Administrator

APPROVED FOR SUBMITTAL



LAURA H. THIELEN
Chairperson

Attachment

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

RUSSELL TSUJI
DEPUTY DIRECTOR - LAND

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

April 6, 2010

TO: Division of Aquatic Resources File

THROUGH: Laura H. Thielen, Chairperson

FROM: Francis Oishi, Program Manager
Division of Aquatic Resources

A handwritten signature in black ink, appearing to be "FO", is written next to the name Francis Oishi.

DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT
UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR
PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. BRIAN
BOWEN, UNIVERSITY OF HAWAII, HAWAII INSTITUTE OF MARINE BIOLOGY, FOR ACCESS TO STATE
WATERS TO CONDUCT REEF FISH GENETIC SURVEY ACTIVITIES
UNDER PERMIT PMNM-2010-038.

The following permitted activities are found to be exempted from preparation of an environmental assessment under the authority of Chapter 343, HRS and Chapter 11-200, HAR:

Project Title:

Papahānaumokuākea Marine National Monument Research Permit to Dr. Brian Bowen, University of Hawaii, Hawaii Institute of Marine Biology, for Access to State Waters to Conduct Reef Fish Genetic Survey Activities.

Permit Number: PMNM-2010-038.

Project Description:

The research permit application, as described below, would allow entry and activities to occur in Papahānaumokuākea Marine National Monument (Monument), including the NWHI State waters from May 1, 2010 through November 30, 2010.

This project is to conduct a genetic survey of reef fishes, which would address the level of isolation between reef ecosystems across the Hawaiian Archipelago. In addition, DNA technology would be used to examine an invasive parasite that was introduced to Oahu in the 1950s, but has been detected in Papahānaumokuākea. The activities in the permit include collecting target reef fish species. The target species were chosen to be abundant and widespread in the archipelago, easy to identify, and easy to collect. No more than 10 specimens/species would be taken at any single location. Whenever possible, the permittee samples non-lethally and removes a rice-grain sized piece of fin and releases the animal in the location from which it was collected. Although significant progress has been made in nonlethal sampling, most specimens are collected with polespears.

April 6, 2010

The proposed activities are in direct support of the Monument Management Plan's priority management need 3.1 – Understanding and Interpreting the NWHI (through action plan 3.1.1 – Marine Conservation Science). This action plan specifies to "measure connectivity and genetic diversity of key species to enhance management decisions." Activities to support marine conservation science, including connectivity and genetic diversity surveys such as those to be carried out by the permittee, are also addressed in the Monument Management Plan Environmental Assessment (December 2008) which resulted in FONSI. This EA summarizes that understanding the genetic diversity of species groups and how these populations change could be helpful to forecast, prepare for and mediate potential threats to populations within the Monument (PMNM MMP Vol. 2, p.171). Identification of genetic diversity and connectivity of reef fishes, such as those proposed, would enhance this understanding.

Consulted Parties:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since March 15th, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Exemption Determination:

After reviewing HAR § 11-200-8, including the criteria used to determine significance under HAR § 11-200-12, DLNR has concluded that the activities under this permit would have minimal or no significant effect on the environment and that issuance of the permit is categorically exempt from the requirement to prepare an environmental assessment based on the following analysis:

1. All activities associated with this permit, including the sampling and subsequent genetic and taxonomic study of reef fishes, have been evaluated as a single action. As a preliminary matter, multiple or phased actions, such as when a group of actions are part of a larger undertaking, or when an individual project is precedent to or represents a commitment to a larger project, must be grouped together and evaluated as a single action. HAR § 11-200-7. Since this permit involves an activity that is precedent to a later planned activity, i.e. the genetic study of patterns of reef fish dispersal, the categorical exemption determination here will treat all planned activities as a single action.

2. The Exemption Class for Scientific Research with no Serious or Major Environmental Disturbance Appears to Apply. Chapter 343, HRS, and § 11-200-8, HAR, provide for a list of classes of actions exempt from environmental assessment requirements. HAR §11-200-8.A.5. exempts the class of actions which involve "basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource." This exemption class has been interpreted to include fish collection for marine surveys and research, as well as research related to the development and management of various aquatic organisms, including life history, migration, and growth studies, such as those being proposed.

April 6, 2010

In addition Exemption Class #5, Exempt Item #5 includes "surveys, censuses, inventories, studies . . . collection, culture and captive propagation of aquatic biota." DEPARTMENT OF LAND & NATURAL RESOURCES, EXEMPTION LIST FOR THE DIVISION OF FISH AND GAME 3-4 (January 19, 1976).

The proposed sampling and genetic connectivity study activities here appear to fall squarely under the exemption class identified under HAR § 11-200-8.A.5., and are succinctly described under the 1976 exemption list, as involving the collection of aquatic animals to study migration patterns and life cycles. As discussed below, no significant disturbance to any environmental resource is anticipated from the sampling of common reef fish species. Thus, so long as the below considerations are met, an exemption class should include the action now contemplated.

3. Cumulative Impacts of Actions in the Same Place and Impacts with Respect to the Potentially Particularly Sensitive Environment Will Not be Significant. Even where a categorical exemption appears to include a proposed action, the action cannot be declared exempt if "the cumulative impact of planned successive actions in the same place, over time, is significant, or when an action that is normally insignificant in its impact on the environment may be significant in a particularly sensitive environment." HAR § 11-200-8.B. To gauge whether a significant impact or effect is probable, an exempting agency must consider every phase of a proposed action, any expected primary and secondary consequences, the long-term and short-term effects of the action, the overall and cumulative effect of the action, and the sum effects of an action on the quality of the environment. HAR § 11-200-12. Examples of actions which commonly have a significant effect on the environment are listed under HAR § 11-200-12.

No prior studies of this type have been undertaken to date. The applicant outlined the entire shallow-water set of collections in his first permit application, and the subsequent renewal application is for a subset of the same initial permit activities because the field team was unable to complete the permitted tasks. Additional deep-water collections have been requested and approved in previous years as technological advances in SCUBA make these collections possible. With this in mind, significant cumulative impacts are not anticipated as a result of this activity, and numerous safeguards further ensure that the potentially sensitive environment of the project area will not be significantly affected. All activities will be conducted in a manner compatible with the management direction of the Monument Proclamation in that the activities do not diminish monument resources, qualities, and ecological integrity, or have any indirect, secondary, cultural, or cumulative effects. The joint permit review process did not reveal any anticipated indirect or cumulative impacts, nor did it raise any cultural concerns, that would occur as a result of these activities.

Since no significant cumulative impacts or significant impacts with respect to any particularly sensitive aspect of the project area are anticipated, the categorical exemptions identified above should remain applicable.

4. Overall Impacts will Probably be Minimal and Insignificant. Any foreseeable impacts from the proposed activity will probably be minimal, and further mitigated by general and specific conditions attached to the permit. Specifically, all research activities covered by this permit will be carried out with strict safeguards for the natural, historic, and cultural resources of the Monument as required by Presidential Proclamation 8031, other applicable law and agency policies and standard operating procedures. This project has been subject to the public review process for over a year, as the applicant was in fact permitted to conduct the same activities last

April 6, 2010

year, but the field team was unable to complete the permitted tasks. The current request is an attempt to fulfill activities previously permitted. The sampling proposed is negligible compared to both the acceptable harvest rates of these common reef fish species in the Main Hawaiian Islands, and the estimated consumption of these same species by predatory fishes such as Ulua at each location within the Monument.

Conclusion. Upon consideration of the permit to be approved by the Board of Land and Natural Resources, the potential effects of the above listed project as provided by Chapter 343, HRS and Chapter 11-200 HAR, have been determined to be of probable minimal or no significant effect on the environment and exempt from the preparation of an environmental assessment.

Laura H. Thielen
Board of Land and Natural Resources

Date

Papahānaumokuākea Marine National Monument
RESEARCH Permit Application

NOTE: This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).

ADDITIONAL IMPORTANT INFORMATION:

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED

Send Permit Applications to:

Papahānaumokuākea Marine National Monument Permit Coordinator

6600 Kalaniana'ole Hwy. # 300

Honolulu, HI 96825

nwhipermmit@noaa.gov

PHONE: (808) 397-2660 FAX: (808) 397-2662

SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.

Papahānaumokuākea Marine National Monument Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Bowen, Brian W.

Affiliation: Hawaii Institute of Marine Biology

Permit Category: Research

Proposed Activity Dates: 5/1/10 - 10/31/10

Proposed Method of Entry (Vessel/Plane): RV Hi'ialakai

Proposed Locations: Shallow water habitats (< 200 feet depth), focused on Kure, Midway, Pearl & Hermes, Lisianski, Laysan, Maro Reef, Gardner Pinnacles, French Frigate Shoals, Mokumanamana, and Nihoa. However, we request latitude to sample other regions as weather and opportunity dictate.

Estimated number of individuals (including Applicant) to be covered under this permit:

16

Estimated number of days in the Monument: 55

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...

be a genetic survey of reef fishes, designed to address the level of isolation between reef ecosystems across the Hawaiian Archipelago, and especially throughout the Papahānaumokuākea Marine National Monument.

One aspect of the project is that we will use DNA technology to examine a parasite that may have been accidentally introduced in the 1950's. This parasitic nematode, *Spirocamallanus istiblenni*, apparently hitchhiked to Hawaii with the blueline snapper *Lutjanus kasmira* and has subsequently spread to native fishes. While the introduction occurred on Oahu, the parasite has been detected in the Monument but has an uncertain distribution.

Another aspect of the project is to measure genetic diversity in five parrotfish species, to compare healthy stocks in the NW Hawaiian Islands with depleted stocks in the main Hawaiian Islands, and previously healthy stocks in the main Hawaiian Islands. This will be accomplished by sequencing mtDNA from parrotfish remains in middens (trash pits) dating back 100-1000 years. To accomplish this we need a maximum of 50 parrotfish specimens from each species, at

collection sites spread across the Monument. No more than 10 specimens/species will be taken at any single island or atoll, and every effort will be made to sample nonlethally. The benefit of this research is to determine whether there has been a historical decrease in genetic diversity in these parrotfishes due to human predation.

Another new aspect to the project is the expansion of diving efforts to greater than 130 feet depth. Specimens will be collected on deep reefs to evaluate the hypothesis that deep reefs can serve as refugia to replenish shallow reefs. Genetic studies can validate or refute this hypothesis, which has clear implications for management and conservation of biological resources. Deep dives during the permit period in 2009 will be used to select species for genetic analysis (ones that are abundant and feasible to collect). In addition, we wish to collect specimens of any new species encountered at depths greater than 130 feet, for genetic characterization, description, and vouchering in the Bishop Museum (see Appendix 1, opportunistic collections). This is an essential activity to characterize the biodiversity of the Monument, and will only be invoked in cases where species are sufficiently abundant (encounter rate of 5+ per hour) to sustain collections without adverse impact.

b.) To accomplish this activity we would
survey approximately 30 fish species at locations across the entire archipelago, using polespears and traps to collect fish, and using mtDNA sequencing technology to resolve novel evolutionary lineages, genetic diversity and connectivity among reef habitats.

c.) This activity would help the Monument by ...
determining whether the Monument is a series of relatively fragile (isolated) ecosystems, or whether individual reef habitats are connected in a larger and more robust ecosystem. There is also a concern about whether the NWHI serves as a source of larvae to replenish depleted fisheries in the main Hawaiian Islands. The assays of population connectivity outlined here will address these issues in a format that has statistical power and scientific credibility.

For example, the most recent findings from this research indicate that the Yellow Tang (*Acanthurus flavescens*) is divided into 4-7 isolated populations within the Hawaiian Archipelago, including three populations in the PMNM (Eble et al. Submitted). This fish is heavily harvested for the ornamental fish trade, and so findings will realign management units for this species. Findings also indicate some connectivity between the Main Hawaiian Islands and the lower NWHI.

Other information or background: To preserve biodiversity, it is important to know how it arises (Bowen and Roman 2005). While the main objective is to assess genetic connectivity among shallow reef habitats, a “value added” component is that we can assess the age and origin of Hawaiian fauna as well as the age and origins of populations on each island. A genealogical approach to relationships among mtDNA haplotypes will indicate whether the closest relatives to the Hawaiian fauna lie predominantly to the West (Ogasawara Arch, Wake Island, or Marshall Islands) or to the South (Johnston Atoll, Line Islands; Gosline 1955; Maragos and Jokiel 1986;

Maragos et al. 2004). In these cases, populations of the widespread Indo-Pacific species will be compared to the Hawaiian endemic. The geographic source of the Hawaiian form (especially Hawaiian endemics) will be resolved with parsimony networks and phylogenetic tools (see Methods), and the age of colonization events will be estimated with the mtDNA molecular clock.

Reef fauna typically have a pelagic phase (eggs and larvae), which lasts 20-60 days, followed by settlement onto a reef where they remain through juvenile and adults stages. Long distance dispersal is accomplished almost exclusively during the pelagic larval phase. However, the geographic limits of such dispersal are uncertain (Bowen et al. 2006a; 2006b). Recent research shows that effective dispersal of marine larvae can fall short of their potential (Swearer et al. 2002). This may be particularly true of the damselfishes, as recent evidence indicates (Ramon et al. 2008), and so we have added four damselfish species to this investigation.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Bowen, Brian W.

Title: Associate Researcher

1a. Intended field Principal Investigator (See instructions for more information):

Carl Meyer for cruise May 11 - June 4, 2010

Joseph DiBattista for cruise July 21 - August 19, 2010

2. Mailing address (street/P.O. box, city, state, country, zip):

Phone:

Fax:

Email:

For students, major professor's name, telephone and email address:

3. Affiliation (institution/agency/organization directly related to the proposed project):

Hawaii Institute of Marine Biology, School of Ocean and Earth Science and Technology,
University of Hawaii

4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):

Randy Kosaki (Ph.D., Research Diver, PMNM), Elizabeth Keenan (Ph.D., Research Diver, PMNM), Ann Mooney (Research diver and collector, PMNM), Kelly Gleason (Research diver

and collector, PMNM), Scott Godwin (Ph.D., Research diver, HIMB), Michael Stat (Ph.D., Research diver, HIMB), Stephen Karl (Ph.D., Research diver, HIMB), Michelle Gaither (Graduate student, Research diver, HIMB), Yannis Papastamatiou (Ph.D., Research diver, HIMB), Tonatiuh Trejo (Graduate student, Research diver, HIMB), Kimberly Tenggardjaja (Graduate student, Research diver, University of California at Santa Cruz), John FitzPatrick (Graduate student, Research diver, University of Hawaii), Jonathan Martinez (Research diver, PMNM), Dan Wagner (Graduate student, Research diver, HIMB), Jonathan Whitney (Graduate student, Research diver, HIMB), Menanie Hutchinson (Graduate student, Research diver, HIMB), Ray Boland (Research diver and divemaster, NMFS), Richard Pyle (Research diver and collector, Bishop Museum), Greg McFall (Research diver and collector, ONMS). Note: Our research team will include two individuals on the cruise 5/11/10 - 6/4/10, two individuals on the cruise 7/21/10 - 8/19/10. This list is meant to include our four scientists, plus other scientists on the cruises with sufficient expertise to assist collections (Randy Kosaki, Yannis Papastamatiou, for example), plus two alternatives from our program (Michelle Gaither and Tonatiuh Trejo).

Section B: Project Information

5a. Project location(s):

<input checked="" type="checkbox"/> Nihoa Island	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Necker Island (Mokumanamana)	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> French Frigate Shoals	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Gardner Pinnacles	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Maro Reef			
<input checked="" type="checkbox"/> Laysan Island	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Lisianski Island, Neva Shoal	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Pearl and Hermes Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Midway Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Kure Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Other			

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:

Location	Longitude	Latitude
Kure Atoll	-178.19706492000	28.55825235580
Kure Atoll	-178.19623585400	28.29958375730
Kure Atoll	-178.45987884800	28.29958375730
Kure Atoll	-178.46070791400	28.55742328970
Midway Atoll	-177.19638223300	28.37419969920
Midway Atoll	-177.19721129900	28.13377055310
Midway Atoll	-177.52800864100	28.13459961920
Midway Atoll	-177.52800864100	28.37419969920
Pearl and Hermes Atoll	-176.08850981800	28.04643025580
Pearl and Hermes Atoll	-175.63289162600	28.04539944540
Pearl and Hermes Atoll	-175.63289162600	27.70729363750
Pearl and Hermes Atoll	-176.08954062900	27.70626282710
Lisianski Island	-173.67292570900	26.25150771120
Lisianski Island	-173.67292570900	25.83942708400
Lisianski Island	-174.23095155800	25.83942708400
Lisianski Island	-174.23095155800	26.25150771120
Laysan Island	-171.47900122300	25.96027179830
Laysan Island	-171.47725234300	25.65596666490
Laysan Island	-171.97918092500	25.65771554490
Laysan Island	-171.97918092500	25.96202067840
Maro Reef	-170.18133220600	25.69968866680
Maro Reef	-170.17958332600	25.21524888540
Maro Reef	-171.00505472200	25.21524888540
Maro Reef	-171.00505472200	25.69968866680

Gardner Pinnacles	-167.74832319300	25.26070709440
Gardner Pinnacles	-167.75087047400	24.34878019150
Gardner Pinnacles	-168.36221811900	24.35132747340
Gardner Pinnacles	-168.36476540100	25.26070709440
French Frigate Shoals	-165.93465851400	23.94630965900
French Frigate Shoals	-165.93465851400	23.56421738120
French Frigate Shoals	-166.45685129400	23.56421738120
French Frigate Shoals	-166.45685129400	23.94630965900
Necker Island	-164.13627752700	23.71705429230
Necker Island	-164.13373024500	23.20505064020
Necker Island	-164.92084033700	23.20505064020
Necker Island	-164.92338761900	23.71960157420
Nihoa Island	-161.66031956700	23.23816530420
Nihoa Island	-161.66286684900	22.94013332760
Nihoa Island	-162.05005369100	22.94268060940
Nihoa Island	-162.05260097200	23.23561802240

5b. Check all applicable regulated activities proposed to be conducted in the Monument:

- ☒ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource
- ☐ Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands
- ☐ Anchoring a vessel
- ☐ Deserting a vessel aground, at anchor, or adrift
- ☐ Discharging or depositing any material or matter into the Monument
- ☐ Touching coral, living or dead
- ☒ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- ☐ Attracting any living Monument resource
- ☐ Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)
- ☐ Subsistence fishing (State waters only)
- ☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

6 Purpose/Need/Scope *State purpose of proposed activities:*

The proposed research is a genetic survey of reef fishes, primarily designed to address the issue of population connectivity across the NWHI. We will survey approximately 30 species across the entire archipelago, using mtDNA sequencing technology.

Management need: An ongoing issue for management of the NWHI is whether this is a series of relatively fragile (isolated) ecosystems, or whether reef habitats are connected in a larger and more robust ecosystem. There is also a concern about whether the NWHI serves as a source of larvae to replenish depleted fisheries in the main Hawaiian Islands. The assays of population connectivity outlined here will address these issues in a format that has statistical power and scientific credibility.

The primary purpose of the proposed research is to define the level of isolation among reef communities in the NW Hawaiian archipelago. How fragile are the geographically isolated reef habitats of the NWHI? If these habitats are highly connected by larval dispersal, then any one of them can recover quickly from human or natural perturbation. If they are isolated, they have to recover without significant input from other islands and atolls.

A second goal of the research is to track the spread of a nematode believed to be introduced into Hawaii with the ta'ape (*Lutjanus kasmira*) about 50 years ago. This nematode is widespread in the main hawaiian islands, but so far has not been observed west of French Frigate Shoals.

Objectives: The objective of this permit request is a genetic (mtDNA) survey fish species across the NWHI to assess the level of connectivity among isolated reef habitats. We can accomplish this with samples of up to 30 fish specimens/species/location. Each location is defined as an atoll or reef, and collections will be made at a low density of approximately 10 individuals per hectare with nets and polespears. The target species are chosen to be abundant and widespread in the archipelago, easy to identify, and easy to collect. Every effort is made to minimize the impact of these collections on the natural communities.

We are also developing a genetic assay to detect the putative introduced parasite, the nematode *Spirocamallanus istiblenni*, using the same mtDNA technology we apply to fish studies. We already know that this parasite occurs as far north as French Frigate Shoals (G. Aeby, pers. comm.), has not spread as far as Midway, but has an uncertain distribution in the Monument. Another unknown is how much the nematode has spread to other native fish species. For this reason our request includes specimens from five goatfish, one surgeonfish (*Ctenochaetus strigosus*), and the original host (ta'ape, *Lutjanus kasmira*)

Management benefits: These data will provide information on connectivity required for management, and can also detect cryptic endemic species and document the patterns and history of species entering the Hawaiian Archipelago. Furthermore, by documenting the pattern and magnitude of connectivity in a diverse set of fish taxa, we can determine if there are general patterns that can guide management decisions for understudied species. The genetic surveys of connectivity among reef habitats will substantially augment the scientific foundation for conservation measures. Specifically, this research will establish whether reef ecosystems of the NW Hawaiian Islands are isolated management units (as preliminary data indicate) or components of an interactive metapopulation. In the former case, each reef ecosystem will have to recover from environmental insults (whether human or natural) without significant input from other reef ecosystems. A corresponding conservation mandate would be that each ecosystem is an independent management unit.

This is a multiyear project and progress to date includes completed collections for ten species, and the first round of data (see publications below). One outcome is that the endemic fish species seem to have more population structure than the widespread Pacific species (Eble et al. 2009). This somewhat counterintuitive finding indicates that the endemic species are poor dispersers. Once they colonize Hawaii, they are unable to maintain genetic connectivity with the source population outside the Hawaiian Archipelago (Eble et al. 2009). This finding, combined with the restricted range of endemic species, indicates a management concern for endemic species.

7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

Our first step is to consult Hawaiian cultural practitioners to identify the special locations and activities that could infringe on kanaka maoli spiritual beliefs. In pursuit of this goal, I have requested guidance from the Office of Hawaiian Affairs, and have reminded my research team that this training is essential to a successful project. My team members have already received some guidance in the first five years of this project, including a review of the kapu principles that have promoted ecosystem health and sustainability. We also recognize the tradition of the mano aumakuas, and for this reason we refrain from lethal sampling of sharks.

To protect natural resources, we abide by the principles of taking only the absolute minimum necessary to provide the information required by the Proclamation for protection of the Monument. This research team is very experienced and knowledgeable about what organisms are sensitive to touch or contact, and we minimize contact with live coral stands.

To provide adequate protection of historical locations and objects, we do not set foot on uninhabited islands, and we do not touch or disturb submerged artifacts. We maintain a strict policy of no contact.

To maintain cultural integrity, we seek advice from the Office of Hawaiian Affairs, and Hawaiian cultural practitioners. We restrict lethal sampling to common, widespread, and abundant species that number in the millions. We collect at low density in any one area and spread the collections across multiple locations. Our collections total a few kilograms per island or atoll, and are miniscule when contrasted with the estimated 30,000 tons of fish taken by ulua and other large predators every year at a single atoll (Sudekum et al. 1991; Freidlander and DeMartini 2002).

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects?

We are fully compliant with conditions described in the Findings of Presidential Proclamation 8031, particularly Section 3.a.i.A-D concerning the compatibility with management direction of the proclamation. These concerns also include ecological integrity and minimal impact.

This research is mandated by the Proclamation directive to maintain ecosystem integrity.

One ongoing goal is develop (and in some cases pioneer) technology for nonlethal sampling of fishes. We have spent three years testing traps to catch fishes for nonlethal sampling. Our first set of nylon twine/steel frame traps were destroyed by sharks within minutes after we set them. However, our second set employed the F- plus plastic trap with much greater success. These traps have been tested rigorously around HIMB.

We also tested nets for nonlethal sampling during the 2006 NWHI collecting trip, with less success. Based on the expertise of Dr. Jill Zamzow, we found that net trapping was much less efficient than pole spearing, although we will continue to use this methodology where possible for some of the small fish such as blennies (Family Bleniidae).

In sum, we make every effort to maximize management benefits, and minimize negative impacts to the system, including decontamination between locations as outlined in the Procedures below. We believe that we have implemented every reasonable safeguard for the resources and ecological integrity of the Monument in our research, and we do not expect any detectable impact from our research sampling.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

There is no practical alternative to conducting this research in the Monument because it is a description of the Monument from the perspective of connectivity and isolation among reef habitats. Clearly we have to sample habitats within the NWHI to resolve connectivity in this region.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?

The end value of the research clearly outweighs the imperceptible impacts from our sampling. Our collections of a few kilograms of fish, spread across thousands of hectares, are miniscule compared to the tens of thousands of tons harvested naturally by apex predators (Sudekum et al. 1991; Freidlander and DeMartini 2002). In contrast, reef connectivity data will have a direct positive impact in the identification of vulnerable locations and species, and will inform the assessment of hazards for atolls and islands of the the Monument. The connectivity issue is identified as an essential foundation for reef management in the journal Science (Dawson et al. 2006).

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.

This is an ongoing multi-year project that will conclude major field efforts in 2010. The duration of the proposed activity is much shorter than the time needed to complete the project.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

P.I. Bowen will lead the project, with 20 years experience in this field, including four prior expeditions to the NWHI and over 80 scientific publications pertaining to reef fishes, endangered species, and conservation. He is known to the MNM staff, DAR staff, and USFWS staff, and is clearly qualified to perform this research.

Field P.I. Carl Meyer (Ph.D.) is the veteran of five previous PMNM expeditions and is thoroughly qualified to identify and capture permitted species with minimal collateral damage. Field P.I. Joseph DiBattista (Ph.D.) has conducted similar research on fishes in both the Atlantic and Pacific basins, and recently conducted an expedition to the Marquesas to collect the same species with the same technology. He is highly qualified to collect specimens with minimal collateral damage.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

The field-based component of this project is supported by a 25 day allocation of ship time (5/11/10 - 6/4/10), a 30 day allocation of ship time (7/21/10 - 8/19/10) on the NOAA research vessel Hiiialakai, a line item in the budget of the Monument. Subsequent lab-based research is supported by National Science Foundation (grants OCE-0903129 to B. Bowen), and the HIMB-NWHI Coral Reef Research Partnership (NMSP MOA 2005-008/66882).

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.

The genetic methods outlined herein have been employed by Bowen and Toonen in over 100 peer-reviewed publications, and are widely recognized as appropriate for the proposed activity. The fact that both Toonen and Bowen have been awarded highly-competitive NSF grants to expand these activities speaks to the quality of the research. The use of genetic sampling is widely regarded as the most efficient and robust way in which to answer questions of connectivity on these scales. To promote historical and cultural integrity, we completely avoid sacred sites and historical sites, we don't set foot on uninhabited islands, and we don't sample species that are designated as kapu (such as moi and mano).

Statistical rigor requires an optimum sample size of 30-50 should be obtained.

Therefore, in the interest of maintaining statistical rigor while minimizing the number of samples collected, our target sample size is 30/location for most fish species. All species in our list are common reef fish that can easily sustain such collection pressure.

All scuba equipment is soaked in a bleach solution between sampling locations, in compliance with decontamination protocols.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?

Yes

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.

This is a continuation of research efforts that have been conducted for four years and through the entire history of the Monument. During these previous efforts, there have been no problems with permit violations by my research team, no safety issues, and no complaints of offensive

behavior. In these circumstances there are no other factors that would make the issuance of the permit inappropriate.

8. Procedures/Methods:

FIELD METHODS

The fish species listed in Appendix 1 inhabit shallow reefs and are accessible via snorkeling and scuba dives. The primary methodology for collecting fishes is with the use of Hawaiian polespears. Alternative methods such as hook and line fishing are not as selective and spearing allows us to collect only the species we need while avoiding unnecessary bycatch. Whenever possible, we sample non-lethally and remove a rice-grain sized piece of fin (biopsy of less than one square cm) and release the animal in the location from which it was collected. We have made significant progress in nonlethal sampling (see Section 7-B above), however most specimens are collected with polespears.

Statistical rigor requires a minimum sample size of 25 individuals per location. In studies examining the statistical power for inferring connectivity based on molecular tools, Ruzzante (1998) showed that sample sizes of less than 30-50 had significant bias and could be misleading. Therefore, in the interest of maintaining statistical rigor while minimizing the number of samples collected, our target sample size is 30/location for most fish species.

All scuba equipment is soaked in a bleach solution between sampling locations, in compliance with decontamination protocols.

LAB METHODS

The primary lab methodology in this study will be sequencing of mtDNA cytochrome genes. In most species, a segment of approximately 800 base pairs of the mtDNA cytochrome b or cytochrome oxidase gene will be amplified and sequenced following

protocols used daily in our laboratory. DNA sequences will be generated with an ABI 3100 automated DNA sequencer in our lab. Genomic DNA aliquots will be maintained in long-term storage at HIMB so that the genetic material collected will be available for future studies.

Advances in population genetics, especially coalescence theory, will greatly enhance our analysis, elucidating the history of reef organisms, including the effective population size, founder events, and patterns of population collapse and recovery (Harpending et al. 1998, Beerli and Felsenstein 2001, Emerson et al. 2001).

DNA sequence variation will be summarized with standard diversity indices and with an analysis of molecular variance (AMOVA) using ARLEQUIN vers. 2 (Schneider et al. 2000). Phylogenetic methods will include neighbor joining and maximum likelihood algorithms in PAUP version 4.0 (Swofford 2002). Population separations will be defined with using F_{st} values and the maximum likelihood approach of MIGRATE vers. 1.7.3 (Beerli and Felsenstein 2001).

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):

Common name:

See Appendix 1

Scientific name:

See Appendix 1

& size of specimens:

See Appendix 1

Collection location:

See Appendix 1

☐ Whole Organism ☒ Partial Organism

9b. What will be done with the specimens after the project has ended?

To the greatest extent possible, specimens will be frozen and vouchered so that future research efforts can use archived material instead of collecting new specimens.

Preserved tissue samples suitable for DNA work will be archived at HIMB for future permitted uses. PI Bowen will be responsible for the database which will track each sample and will be the lead contact for persons wishing to access the tissue sample collection. No samples will be provided to researchers outside HIMB without prior consent of Permit Coordinators.

9c. Will the organisms be kept alive after collection? ☐ Yes ☒ No

• General site/location for collections:

• Is it an open or closed system? ☐ Open ☐ Closed

• Is there an outfall? ☐ Yes ☐ No

• Will these organisms be housed with other organisms? If so, what are the other organisms?

• Will organisms be released?

10. If applicable, how will the collected samples or specimens be transported out of the Monument?

Frozen fish and fin clips for genetic analysis will be transported in the RV Hiialakai.

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:

It is incumbent on us to make maximum use of specimens, especially when they are derived from lethal collections. Towards this end, we have coordinated fish species lists with a parallel project by Erik Franklin and Matt Craig. They can use the specimens collected initially for genetic analysis to resolve age, growth, diet, and other aspects of natural history. Further, the nonlethal sampling of apex predators (listed in Appendix 1) will make maximum use of the captures conducted by Carl Meyer and colleagues for tagging studies. We previously provided specimens for the Bishop Museum, for ciguatera research at University of Hawaii at Hilo, and for life history studies. We will continue this effort to make the most of precious specimens collected in the NWHI.

An electronic database of all samples is available, and will be updated upon completion of the studies outlined here. This database will be searchable against future permit requests and can reduce the need for return trips to collect tissue samples in the NWHI, and prevent duplicative sampling efforts.

12a. List all specialized gear and materials to be used in this activity:

Materials include snorkel and scuba gear (mask, fins, snorkel, wetsuit, tank, BCD), collection bag, polespear, hand nets, fish traps, and a high resolution digital camera in an underwater housing to photo-document the collections.

12b. List all Hazardous Materials you propose to take to and use within the Monument:

Tissue preservative solutions for DNA analyses include: 95% ethanol (EtOH), MSDS attached, and saturated salt buffer with dimethylsulfoxide (DMSO), MSDS attached. Both EtOH and DMSO are commonly sold for human consumption, and should not pose a significant health or environmental risk.

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:

None

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:

We expect sampling to be mostly complete in 2010, and analysis of specimens is ongoing (Eble et al. 2009; Gaither et al. In press; Eble et al. submitted; Craig et al. submitted). Data analysis and write-up usually take no more than an additional year, although the turn-around time for some journals can exceed 200 days, so time to publication can still be considerable post-submission of the study.

Results from these studies are made available to Monument, FWS, and stat managers as quickly as possible. Brown-bag luncheons at HIMB allow researchers to highlight important or interesting new results and discuss them with the management personnel. In addition, we hold biannual symposia during which researchers present the most current findings from their ongoing research in the Monument. These efforts ensure that research results are provided to the Monument co-trustees as quickly as they become available.

15. List all Applicants' publications directly related to the proposed project:

Craig, M.T., J.A. Eble, D.R. Robertson, B.W. Bowen. 2007. High genetic connectivity across the Indian and Pacific Oceans in the reef fish *Myripristis berndti* (Holocentridae). *Marine Ecology Progress Series* 334: 245–254.

Schultz, J.K., R.L. Pyle, E. DeMartini, and B.W. Bowen. 2007. Genetic homogeneity among color morphs of the flame angelfish, *Centropyge loriculus*. *Marine Biology* 151: 167-175.

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Daly-Engel, T.S., R.D. Grubbs, K.W. Feldheim, B.W. Bowen, R.J. Toonen. Beneficial or unavoidable? Sexual conflict drives low multiple paternity and genetic diversity in the shortspine spurdog shark (*Squalus mitsukurii*). *Marine Ecology Progress Series* In press

Gaither, M., B.W. Bowen, R.J. Toonen, S. Planes, V. Messmer, J. Earle, D.R. Robertson. Genetic consequences of introducing two divergent, allopatric lineages of Bluestripe Snapper (*Lutjanus kasmira*) to Hawaii. *Molecular Ecology* In press

Reece, J.S., B.W. Bowen, K. Joshi, V. Goz, A.F. Larson. Phylogeography of two moray eels indicates high dispersal throughout the Indo-Pacific. *Journal of Heredity* In press

Daly-Engel, T.S., K.M. Duncan, K.N. Holland, J.P. Coffey, H.A. Nance, R.J. Toonen, B.W. Bowen. Male-mediated dispersal in a global ring species, the scalloped hammerhead shark (*Sphyrna lewini*) Submitted

Craig, M.T., J. Eble, B.W. Bowen. Origins, ages, and populations histories: Comparative phylogeography of endemic Hawaiian butterflyfishes (genus *Chaetodon*) Submitted

Eble, J.,A., R.J. Toonen, L.L. Sorensen, L. Basch, Y. Papastamatiou, B.W. Bowen. Phylogeography and historical demography of the Yellow Tang (*Zebrasoma flavescens*) indicate a Hawaiian origin for an Indo-Pacific reef fish. Submitted

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Toonen, R.J. 2001. *Molecular Genetic Analysis of Recruitment and Dispersal in the Intertidal Porcelain Crab, Petrolisthes cinctipes*. Ph.D. Dissertation, Center for Population Biology, Section of Evolution and Ecology, University of California, Davis, CA. 325 pp.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as "confidential" prior to posting the application.

Signature  Date 2/1/10

SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE BELOW:

Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
FAX: (808) 397-2662

DID YOU INCLUDE THESE?

- ☒ Applicant CV/Resume/Biography
- ☒ Intended field Principal Investigator CV/Resume/Biography
- ☒ Electronic and Hard Copy of Application with Signature
- ☒ Statement of information you wish to be kept confidential
- ☒ Material Safety Data Sheets for Hazardous Materials

Appendix 1. Requested Fish Collections for B.W. Bowen

We anticipate that the 2010 field season will conclude major sampling efforts for the shallow reef connectivity studies. As the requested permit activities below indicate, we have completed collections for most shallow-reef fishes at most locations. The emphasis this year is on the reef habitats between French Frigate Shoals and the southern end of the Monument (Mokumanamana, Nihoa), and to a lesser extent French Frigate Shoals north to Pearl and Hermes Atoll (Maro, Laysan). We know that some species show genetic breaks in these regions, but existing samples are inadequate to define this more precisely. **No new species are requested.** Notable aspects of this request include the following points:

- 1) Previously we completed sampling of seven species, and have removed them from the list: Orangecheek surgeonfish *Acanthurus olivaceus*, Yellow tang *Zebrasoma flavescens*, Brown surgeonfish *Acanthurus nigrofuscus*, Blue-lined surgeonfish *Acanthurus nigroris*, Milletseed butterflyfish *Chaetodon miliaris*, Blueline butterflyfish *Chaetodon fremblii*, Pebbled butterflyfish *Chaetodon multicinctus*. Results from these species are published (endemic surgeonfishes, Eble et al. 2009), submitted for publication (endemic butterflyfishes, Craig et al. Submitted; Yellow Tang, Eble et al. Submitted), in an advanced state of preparation (blennies, Szabo et al. In prep; Oval Butterflyfish, Bowen et al. In prep; Bluespine Surgeonfish; Eble et al. In prep), or the subjects of ongoing DNA analyses. **This year we removed five additional species from our permit request, including Blue spine surgeonfish (*Naso unicornis*), oval butterflyfish (*Chaetodon lunulatus*), Yellowtail coris (*Coris gaimard*), Blacktail snapper *Lutjanus fulvus*, and Peacock hind (roi) *Cephalopholis argus*.** For most of the species remaining on this list, 2010 will be the last year for collections.
- 2) We request parrotfish samples (a maximum of ten per location, a maximum of 50 total) from five species of parrotfish, to determine whether overfishing has depressed genetic diversity in the main Hawaiian Islands. This will be accomplished by comparing parrotfish genetic diversity in the Monument, Main Hawaiian Islands, and ancient middens (trash pits) on Hawaii dating to 100-1000 years before present. The accomplishment of sequencing ancient DNA, by Yvonne Chan in our research group, allows a unique historical perspective on fishing, but can only be accomplished with complete surveys of contemporary genetic diversity.
- 3) The second cruise to the Papahānaumokuākea Marine National Monument (July 21 – August 19) will include a deep (>130 feet) diving component to assess the health and biodiversity of this reef fauna. Therefore we request limited latitude to collect voucher specimens of new species that may be encountered at these depths (see below).
- 4) To facilitate the evaluation of this request, we have divided the list of fish into a shallow reef component (near completion) and a deep reef component (still experimental).

As before, to make maximum use of specimens, samples obtained in this project will have multiple uses in other permitted studies, especially the life-history work by Matthew Craig and Eric Franklin, and the disease work by Greta Aeby (separate permit applications pending).

Common name	Scientific name	No., Size, Locations
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SHALLOW REEF COLLECTIONS (< 130 feet depth)

Family Labridae

Ornate wrasse *Halichoeres ornatissimus*

0 all sizes Nihoa
 30 all sizes Mokumanamana
 0 all sizes French Frigate Shoals
 25 all sizes Gardner Pinnacles
 30 all sizes Maro Reef
 28 all sizes Laysan
 30 all sizes Lisianski
 0 all sizes Pearl and Hermes
 0 all sizes Midway
 0 all sizes Kure

Slow wrasse *Coris venusta*

21 all sizes Nihoa
 10 all sizes Mokumanamana
 0 all sizes French Frigate Shoals
 29 all sizes Gardner Pinnacles
 30 all sizes Maro Reef
 0 all sizes Laysan
 27 all sizes Lisianski
 0 all sizes Pearl and Hermes
 0 all sizes Midway
 0 all sizes Kure

Blacktail wrasse *Thalassoma ballieu*

15 all sizes Nihoa
 21 all sizes Mokumanamana
 0 all sizes French Frigate Shoals
 0 all sizes Gardner Pinnacles
 26 all sizes Maro Reef
 0 all sizes Laysan
 11 all sizes Lisianski
 0 all sizes Pearl and Hermes
 0 all sizes Midway
 0 all sizes Kure

Family Scaridae

Spectacled parrotfish *Chlorurus perspicillatus*
 MAXIMUM OF 50 FISH TOTAL

10 all sizes Nihoa
 8 all sizes Mokumanamana
 0 all sizes French Frigate Shoals
 10 all sizes Gardner Pinnacles
 1 all sizes Maro Reef
 0 all sizes Laysan
 10 all sizes Lisianski
 0 all sizes Pearl and Hermes
 0 all sizes Midway
 0 all sizes Kure

Bullethead parrotfish *Chlorurus spilurus*
 MAXIMUM OF 50 FISH TOTAL
 (formerly *C. sordidus*)

10 all sizes Nihoa
 8 all sizes Mokumanamana
 0 all sizes French Frigate Shoals
 0 all sizes Gardner Pinnacles
 10 all sizes Maro Reef
 10 all sizes Laysan

Regal parrotfish *Scarus dubius*
MAXIMUM OF 50 FISH TOTAL

10 all sizes Lisianski
10 all sizes Pearl and Hermes
10 all sizes Midway
10 all sizes Kure

9 all sizes Nihoa
10 all sizes Mokumanamana
0 all sizes French Frigate Shoals
10 all sizes Gardner Pinnacles
0 all sizes Maro Reef
5 all sizes Laysan
10 all sizes Lisianski
0 all sizes Pearl and Hermes
0 all sizes Midway
4 all sizes Kure

Ember parrotfish *Scarus rubroviolaceus*
MAXIMUM OF 50 FISH TOTAL

10 all sizes Nihoa
10 all sizes Mokumanamana
10 all sizes French Frigate Shoals
9 all sizes Gardner Pinnacles
10 all sizes Maro Reef
10 all sizes Laysan
10 all sizes Lisianski
0 all sizes Pearl and Hermes
10 all sizes Midway
10 all sizes Kure

Palenose parrotfish *Scarus psittacus*
MAXIMUM OF 50 FISH TOTAL

10 all sizes Nihoa
10 all sizes Mokumanamana
7 all sizes French Frigate Shoals
10 all sizes Gardner Pinnacles
4 all sizes Maro Reef
9 all sizes Laysan
10 all sizes Lisianski
10 all sizes Pearl and Hermes
6 all sizes Midway
10 all sizes Kure

Family Pomacentridae
Hawaiian Surge wrasse *Abudefduf abdominalis*

28 all sizes Nihoa
9 all sizes Mokumanamana
13 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
7 all sizes Maro Reef
1 all sizes Laysan
30 all sizes Lisianski
0 all sizes Pearl and Hermes
0 all sizes Midway
0 all sizes Kure

Indo-Pacific Surge wrasse *Abudefduf vaigiensis*

28 all sizes Nihoa
23 all sizes Mokumanamana
0 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
30 all sizes Maro Reef
16 all sizes Laysan

	30 all sizes Lisianski
	0 all sizes Pearl and Hermes
	21 all sizes Midway
	29 all sizes Kure
Vanderbilt's Chromis <i>Chromis vanderbilti</i>	16 all sizes Nihoa
	16 all sizes Mokumanamana
	29 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	30 all sizes Maro Reef
	10 all sizes Laysan
	30 all sizes Lisianski
	13 all sizes Pearl and Hermes
	26 all sizes Midway
	18 all sizes Kure
Three-spot Chromis <i>Chromis verater</i>	0 all sizes Nihoa
	30 all sizes Mokumanamana
	30 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	30 all sizes Maro Reef
	30 all sizes Laysan
	30 all sizes Lisianski
	0 all sizes Pearl and Hermes
	30 all sizes Midway
	0 all sizes Kure
Family Blenniidae	
Scarface blenny <i>Cirripectes vanderbilti</i>	14 all sizes Nihoa
	15 all sizes Mokumanamana
	11 all sizes French Frigate Shoals
	15 all sizes Gardner Pinnacles
	15 all sizes Maro Reef
	7 all sizes Laysan
	12 all sizes Lisianski
	4 all sizes Pearl and Hermes
	0 all sizes Midway
	0 all sizes Kure
Fangblenny <i>Plagiotremus goslinei</i>	2 all sizes Nihoa
	13 all sizes Mokumanamana
	5 all sizes French Frigate Shoals
	15 all sizes Gardner Pinnacles
	15 all sizes Maro Reef
	14 all sizes Laysan
	15 all sizes Lisianski
	15 all sizes Pearl and Hermes
	1 all sizes Midway
	4 all sizes Kure
Fangblenny <i>Plagiotremus ewaensis</i>	11 all sizes Nihoa
	13 all sizes Mokumanamana
	14 all sizes Gardner Pinnacles
	14 all sizes Laysan
	15 all sizes Maro Reef
	15 all sizes Lisianski

	15 all sizes Pearl and Hermes
	11 all sizes Midway
	6 all sizes Kure
Family Mullidae	
Yellowstripe goatfish <i>Mulloidichthys flavolineatus</i>	30 all sizes Nihoa
	15 all sizes Mokumanamana
	7 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	21 all sizes Maro Reef
	21 all sizes Laysan
	30 all sizes Lisianski
	17 all sizes Pearl and Hermes
	0 all sizes Midway
	0 all sizes Kure
Yellowfin goatfish <i>Mulloidichthys vanicolensis</i>	23 all sizes Nihoa
	22 all sizes Mokumanamana
	0 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	28 all sizes Maro Reef
	24 all sizes Laysan
	30 all sizes Lisianski
	0 all sizes Pearl and Hermes
	0 all sizes Midway
	0 all sizes Kure
Manybar goatfish <i>Parupeneus multifasciatus</i>	0 all sizes Nihoa
	8 all sizes Mokumanamana
	0 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	30 all sizes Maro Reef
	29 all sizes Laysan
	30 all sizes Lisianski
	0 all sizes Pearl and Hermes
	0 all sizes Midway
	0 all sizes Kure
Sidespot goatfish <i>Parupeneus pleurostigma</i>	29 all sizes Nihoa
	21 all sizes Mokumanamana
	22 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	27 all sizes Maro Reef
	0 all sizes Laysan
	30 all sizes Lisianski
	19 all sizes Pearl and Hermes
	0 all sizes Midway
	0 all sizes Kure
Family Lutjanidae	
Blueline snapper (ta'ape) <i>Lutjanus kasmira</i>	11 all sizes Nihoa
	30 all sizes Mokumanamana
	0 all sizes French Frigate Shoals
INTRODUCED SPECIES	30 all sizes Gardner Pinnacles
	30 all sizes Maro Reef
	30 all sizes Laysan
	30 all sizes Lisianski
	25 all sizes Pearl and Hermes

0 all sizes Midway
30 all sizes Kure

DEEP REEF COLLECTIONS (> 130 feet)

Family Acanthuridae

Goldring bristletooth *Ctenochaetus strigosus*

30 all sizes Nihoa
30 all sizes Mokumanamana
30 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
30 all sizes Maro Reef
30 all sizes Laysan
30 all sizes Lisianski
30 all sizes Pearl and Hermes
30 all sizes Midway
30 all sizes Kure

Family Pomacentridae

Hawaiian Chromis *Chromis ovalis*

30 all sizes Nihoa
30 all sizes Mokumanamana
30 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
30 all sizes Maro Reef
30 all sizes Laysan
30 all sizes Lisianski
30 all sizes Pearl and Hermes
30 all sizes Midway
30 all sizes Kure

Whitetail Chromis *Chromis ovalis*

30 all sizes Nihoa
30 all sizes Mokumanamana
30 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
30 all sizes Maro Reef
30 all sizes Laysan
30 all sizes Lisianski
30 all sizes Pearl and Hermes
30 all sizes Midway
30 all sizes Kure

Three-spot Chromis *Chromis verater*

30 all sizes Nihoa
30 all sizes Mokumanamana
30 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
30 all sizes Maro Reef
30 all sizes Laysan
30 all sizes Lisianski
30 all sizes Pearl and Hermes
30 all sizes Midway
28 all sizes Kure

Hawaiian Dascyllus *Dascyllus albisella*

30 all sizes Nihoa
30 all sizes Mokumanamana
30 all sizes French Frigate Shoals
30 all sizes Gardner Pinnacles
30 all sizes Maro Reef
30 all sizes Laysan

	30 all sizes Lisianski
	30 all sizes Pearl and Hermes
	30 all sizes Midway
	30 all sizes Kure
Family Holocentridae	
Yellowfish soldierfish <i>Myripristis chryseres</i>	30 all sizes Nihoa
	30 all sizes Mokumanamana
	30 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	30 all sizes Maro Reef
	30 all sizes Laysan
	30 all sizes Lisianski
	30 all sizes Pearl and Hermes
	30 all sizes Midway
	30 all sizes Kure
Family Priacanthidae	
Hawaiian Bigeye <i>Priacanthus meeki</i>	30 all sizes Nihoa
	30 all sizes Mokumanamana
	30 all sizes French Frigate Shoals
	30 all sizes Gardner Pinnacles
	30 all sizes Maro Reef
	30 all sizes Laysan
	30 all sizes Lisianski
	30 all sizes Pearl and Hermes
	30 all sizes Midway
	30 all sizes Kure

Opportunistic Sampling of Apex Predators

We request authority to collect and archive tissue specimens of less than one gram weight from the apex predators captured during tagging studies by Carl Meyer and colleagues. In the course of placing acoustic and satellite tags, a small piece of tissue is dislodged from the fish, and we seek to archive these under the mandate to make maximum use of sampling opportunities. Under no circumstances will these species be subject to directed fishing effort. Possible capture species include, but are not limited to:

Tiger shark	<i>Galeocerdo cuvier</i>
Galapagos shark	<i>Carcharhinus galapagensis</i>
Grey reef shark	<i>Carcharhinus amblyrhynchos</i>
Blacktip shark	<i>Carcharhinus melanopterus</i>
Whitetip reef shark	<i>Triaenodon obesus</i>
Jack (Ulua)	<i>Caranx spp.</i>
Green jobfish	<i>Aprion virescens</i>
Barracuda	<i>Sphyrna barracuda</i>
Tuna	<i>Thunnus spp.</i>

Opportunistic sampling of new species

In 2009 the Hiialakai cruise July 21 – August 19 will include deep diving (> 130 feet) with trimix scuba technology. In these circumstances we wish to collect specimens of new fish species, for genetic characterization, taxonomic description, and vouchering in the Bishop Museum. These collections will allow us to characterize the fish biodiversity of the Monument, and will only be made in cases where species are sufficiently abundant (encounter rate of 5+ per hour) to sustain collections without adverse impact. Encounters with rarer species will be documented with photo-vouchers.

New fish species A maximum of five specimens/species at each island or atoll

Papahānaumokuākea Marine National Monument Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant):

May-June Cruise: A maximum of six divers including PMNM personnel

July-August cruise: A maximum of six deep divers (Kosaki and colleagues) and six shallow divers (DiBattista and colleagues), including PMNM personnel

Permit activities will be conducted by a subset of the following persons. We have no berths on the May-June cruise (a change since our application), and any collections will be made as time allows by field P.I. Carl Meyer with students Jon Dale, Derek Smith, John FitzPatrick (alternate) and Christian Clark (alternate). We have two berths on the July-August cruise, intended for field P.I. Joseph DiBattista and graduate student Kim Tenggardjaja, but hope to have assistance by Steve Karl, Dan Wagner, Jon Dale, and Roxanne Haverkort (alternate) as time allows. Deep reef collections on the July-August cruise will be conducted by Randall Kosaki, Greg McFall, Ray Boland, Richard Pyle, Dan Wagner, and Yannis Papastamatiou. All personnel are certified divers with advanced (graduate level or higher) scientific training:

Brian Bowen, P.I., research diver, collector, and P.I.
Joseph DiBattista, research diver, collector, and field P.I. (July-August)
Carl Meyer, research diver, collector, and field P.I. (May-June)

Randall Kosaki, Chief Scientist, research diver and collector, PMNM
Elizabeth Keenan, research diver and collector, PMNM
Ann Mooney, research diver and collector, PMNM
Kelly Gleason, research diver and collector, PMNM
Jonathan Martinez, research diver and collector, PMNM

Stephen Karl – research diver and collector, HIMB
Yannis Papastamatiou, research diver and collector, HIMB
Daniel Wagner, research diver and collector, HIMB
Kimberly Tenggardjaja – research diver and collector, Univ. Cal. Santa Cruz
Jonathan Whitney – research diver and collector, HIMB
John Dale, research diver and collector, UH Zoology
Derek Smith, research diver and collector, HIMB
Ray Boland, research diver and divemaster, NMFS
Richard Pyle, research diver and collector, Bishop Museum
Greg McFall, research diver and collector, ONMS

Alternate personnel:

Roxanne Haverkort – research diver and collector, HIMB
 John Fitzpatrick – research diver and collector, HIMB
 Christian Clark – research diver and collector, HIMB

2. Specific Site Location(s): (Attach copies of specific collection locations):

Sampling will take place in a variety of reef and lagoonal habitats between 0 and 30 meters depth. Due to the nature of the research, and the unpredictability of the weather, the precise locations where samples will be collected at each location will not be known until sampling takes place.

All submerged Locations: Nihoa Island, Necker Island, French Figate Shoals, Gardener Pinnacles, Maro Reef, Laysan Island, Lisianski Island, Pearl and Hermes Atoll, Midway Atoll, Kure Atoll.

Approximate Locations:

Location	Longitude	Latitude
Kure Atoll	-178.19706492000	28.55825235580
Kure Atoll	-178.19623585400	28.29958375730
Kure Atoll	-178.45987884800	28.29958375730
Kure Atoll	-178.46070791400	28.55742328970
Midway Atoll	-177.19638223300	28.37419969920
Midway Atoll	-177.19721129900	28.13377055310
Midway Atoll	-177.52800864100	28.13459961920
Midway Atoll	-177.52800864100	28.37419969920
Pearl and Hermes Atoll	-176.08850981800	28.04643025580
Pearl and Hermes Atoll	-175.63289162600	28.04539944540
Pearl and Hermes Atoll	-175.63289162600	27.70729363750
Pearl and Hermes Atoll	-176.08954062900	27.70626282710
Lisianski Island	-173.67292570900	26.25150771120
Lisianski Island	-173.67292570900	25.83942708400
Lisianski Island	-174.23095155800	25.83942708400
Lisianski Island	-174.23095155800	26.25150771120
Laysan Island	-171.47900122300	25.96027179830
Laysan Island	-171.47725234300	25.65596666490
Laysan Island	-171.97918092500	25.65771554490
Laysan Island	-171.97918092500	25.96202067840
Maro Reef	-170.18133220600	25.69968866680
Maro Reef	-170.17958332600	25.21524888540
Maro Reef	-171.00505472200	25.21524888540
Maro Reef	-171.00505472200	25.69968866680
Gardner Pinnacles	-167.74832319300	25.26070709440
Gardner Pinnacles	-167.75087047400	24.34878019150
Gardner Pinnacles	-168.36221811900	24.35132747340

Gardner Pinnacles	-168.36476540100	25.26070709440
French Frigate Shoals	-165.93465851400	23.94630965900
French Frigate Shoals	-165.93465851400	23.56421738120
French Frigate Shoals	-166.45685129400	23.56421738120
French Frigate Shoals	-166.45685129400	23.94630965900
Necker Island	-164.13627752700	23.71705429230
Necker Island	-164.13373024500	23.20505064020
Necker Island	-164.92084033700	23.20505064020
Necker Island	-164.92338761900	23.71960157420
Nihoa Island	-161.66031956700	23.23816530420
Nihoa Island	-161.66286684900	22.94013332760
Nihoa Island	-162.05005369100	22.94268060940
Nihoa Island	-162.05260097200	23.23561802240

3. Other permits (list and attach documentation of all other related Federal or State permits):

None

3a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation.

None

4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information):

This research is funded primarily by NWHIMNM-HIMB partnership, but additional funding comes from a variety of sources including Hawaii SeaGrant, NOAA, and the National Science Foundation. The HIMB currently has all of the lab equipment and expertise to successfully complete the analysis for this project. As detailed in the initial permit application there are adequate finances to complete this work. Detailed budget information is available upon request from the Monument Permit Coordinators.

5. Time frame:

Activity start: 1 January 2005

Activity completion: 30 May 2012

Dates actively inside the Monument in 2010:

From: 11 May 2010

To: June 4, 2010

From: 21 July 2010

To: 19 August 2010

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application:

All dates are tentative and dependent upon ship and weather conditions. Ocean conditions strongly influence the dates that vessels can enter Monument waters, as well as when research can be conducted while in the Monument waters. Dates are also dependent on vessel and personnel schedules. Co-trustees will be notified of any changes to the dates currently provided

Personnel schedule in the Monument:

All personnel will remain on the NOAA vessel Hi'ialakai (or on small boats that are transported to the Monument by the main vessel) throughout the cruise duration. No individual will go on land to conduct this research.

Tentative schedule for HIMB NWHI Cruise, Hi'ialakai, May-June 2010:

(This is the only information I have.)

- 1 day Lisianski
- 3/4 days P&H
- 4 days FFS
- 3 days Midway
- 2/3 days Kure
- 1 day Nihoa

Schedule for July-August not yet determined.

6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument:

All divers are requested to carry DAN insurance in addition to UH workers compensation that will cover any diving related injury or an accident that occurs while on a diving research cruise.

7. Check the appropriate box to indicate how personnel will enter the Monument:

- ☒ Vessel
☐ Aircraft

Provide Vessel and Aircraft information:

NOAA vessel Hi'ialakai

8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation):

- ☐ Rodent free, Date:
- ☐ Tender vessel, Date:
- ☐ Ballast water, Date:
- ☐ Gear/equipment, Date:
- ☐ Hull inspection, Date:

9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):

Vessel name:

Vessel owner:

Captain's name:

IMO#:

Vessel ID#:

Flag:

Vessel type:

Call sign:

Embarkation port:

Last port vessel will have been at prior to this embarkation:

Length:

Gross tonnage:

Total ballast water capacity volume (m3):

Total number of ballast water tanks on ship:

Total fuel capacity:

Total number of fuel tanks on ship:

Marine Sanitation Device:

Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems:

Other fuel/hazardous materials to be carried on board and amounts:

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and

contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

VMS Email:
Inmarsat ID#:

10. Tender information:

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors:

TBD by NOAA crew aboard vessel Hi'ialakai. Generaly, two inboard diesel jet boats and a zodiac with an outboard gasoline engine.

Additional Information for Land Based Operations

11. Proposed movement of personnel, gear, materials, and, if applicable, samples:

12. Room and board requirements on island:

13. Work space needs:

DID YOU INCLUDE THESE?

- ☐ Map(s) or GPS point(s) of Project Location(s), if applicable
- ☐ Funding Proposal(s)
- ☐ Funding and Award Documentation, if already received
- ☐ Documentation of Insurance, if already received
- ☐ Documentation of Inspections
- ☐ Documentation of all required Federal and State Permits or applications for permits